

REMARKS

Claim Rejections 35 U.S.C. § 103 (a)

The Examiner has rejected claims 1-30 under 35 U.S.C. §103 (a) as being unpatentable over Sewell (U.S. 6,809,794) in view of Szmanda et al. (U.S. 6,787,286).

Claims 1-12

Applicants respectfully disagree with the Examiner. Applicants have amended claim 1. Support is provided by the specification including in paragraphs [0031], [0034], [0036], and [0037].

Claim 1, as amended, of Applicants' claimed invention claims a method (200) comprising: method comprising: providing a photolithographic scanner, said photolithographic scanner comprising a light source and a last lens element, said light source producing light having a wavelength, said last lens element having a refractive index; providing an index-matching liquid (IML) (205) based on said wavelength and said refractive index; providing a photoresist (215), said photoresist comprising a combination (210) of one or more IML-non-soluble additives and one or more IML-soluble-additives and other constituents wherein form and concentration are determined by properties of said IML; binding said other constituents of said photoresist to said IML-non-soluble additives; placing said IML in contact with both said last lens element and said photoresist; preventing diffusion of said IML-non-soluble additives and said other bound constituents into said IML;

thus neutralizing acid diffusing from said IML into said photoresist; promoting diffusion of said IML-soluble-additives from said photoresist into said IML and creating a concentration of said IML-soluble additives in said IML; thus improving wettability and creating surface inhibition of surface layer of said photoresist; and illuminating said IML and said photoresist with said light from said last lens element. See Figure 2.

In contrast, neither the Sewell nor the Szmanda et al. references cited by the Examiner teaches providing a photoresist between a last lens element (of a photolithographic scanner) and an index-matching liquid (IML) wherein the photoresist includes a combination of one or more IML-non-soluble additives to neutralize acid and one or more IML-soluble-additives to improve wettability and create surface inhibition of surface layer of the photoresist.

Thus, a combination of the method of Sewell and the method of Szmanda et al., even if possible, would still not produce the method of Applicants' claimed invention, as claimed in claim 1, as amended. Consequently, the two cited references, whether individually or collectively, do not render obvious claim 1, as amended, of Applicants' claimed invention to one of ordinary skill in the art of performing photolithography at the time the invention was made.

Claims 2-12 are dependent on claim 1.

Thus, a combination of the method of Sewell and the method of Szmanda et al., even if possible, would also not produce the method of Applicants' claimed invention, as claimed in claims 2-12. Consequently, the two cited references, whether individually or collectively, also do not render obvious claims 2-12, as amended, of Applicants' claimed invention to one of ordinary skill in the art of performing photolithography at the time the invention was made.

In view of the foregoing, Applicants respectfully request the Examiner to withdraw the rejections to claims 1-12 under 35 U.S.C. §103 (a).

Claims 13-26

Applicants respectfully disagree with the Examiner. Applicants have amended claim 13. Support is provided by the specification, including in paragraph [0021].

Claim 13, as amended, of Applicants' claimed invention claims an apparatus (300) comprising: a substrate (301); a photoresist (302) disposed in contact said substrate; an index-matching liquid (IML) (303) disposed in contact with said photoresist; and a last lens element (304) disposed in contact with said IML, wherein said photoresist comprises a protective layer formed by one or more IML-non-soluble additives wherein said protective layer has reduced surface interaction in contact with said IML due to one or more IML-soluble-additives. See Figure 4.

In contrast, neither the Sewell nor the Szmanda et al. references cited by the Examiner teaches an apparatus that includes a photoresist located between a substrate and an index-matching liquid (IML) wherein the photoresist includes a protective layer formed by one or more IML-non-soluble additives wherein the protective layer has reduced surface interaction in contact with the IML due to one or more IML-soluble-additives.

Thus, a combination of the method of Sewell and the method of Szmanda et al., even if possible, would still not produce the method of Applicants' claimed invention, as claimed in claim 13, as amended. Consequently, the two cited references, whether individually or collectively, do not render obvious claim 13, as amended, of Applicants' claimed invention to one of ordinary skill in the art of performing photolithography at the time the invention was made.

Claims 14-26 are dependent on claim 13.

Thus, a combination of the method of Sewell and the method of Szmanda et al., even if possible, would also not produce the method of Applicants' claimed

invention, as claimed in claims 14-26. Consequently, the two cited references, whether individually or collectively, do not render obvious claims 14-26, as amended, of Applicants' claimed invention to one of ordinary skill in the art of performing photolithography at the time the invention was made.

In view of the foregoing, Applicants respectfully request the Examiner to withdraw the rejections to claims 13-26 under 35 U.S.C. §103 (a).

Claims 27-30

Applicants respectfully disagree with the Examiner. Applicants have amended claim 27. Support is provided by the specification, including in paragraph [0021].

Claim 27, as amended, of Applicants' claimed invention claims a system (400) comprising: a last lens element (404) of a lithography exposure system, said last lens element having a specific index of refraction; a specific index-matching liquid (IML) (403) in contact with said last lens element, said specific IML having an index of refraction equal to said specific index of refraction to within a specified tolerance, said specific IML comprising one or more IML-soluble-additives to reduce surface interaction with a photoresist (402); and said photoresist in contact with said specific IML, said photoresist comprising a protective layer formed from one or more IML-non-soluble additives to reduce surface interaction with said specific IML. See Figure 3.

In contrast, neither the Sewell nor the Szmanda et al. references cited by the Examiner teaches a system that includes a photoresist located in contact with an index-matching liquid (IML) wherein the photoresist includes a protective layer

formed from one or more IML-non-soluble additives to reduce surface interaction with the specific IML.

Thus, a combination of the method of Sewell and the method of Szmanda et al., even if possible, would still not produce the method of Applicants' claimed invention, as claimed in claim 27, as amended. Consequently, the two cited references, whether individually or collectively, do not render obvious claim 27, as amended, of Applicants' claimed invention to one of ordinary skill in the art of performing photolithography at the time the invention was made.

Claims 28-30 are dependent on claim 27.

Thus, a combination of the method of Sewell and the method of Szmanda et al., even if possible, would also not produce the method of Applicants' claimed invention, as claimed in claims 28-30. Consequently, the two cited references, whether individually or collectively, do not render obvious claims 28-30, as amended, of Applicants' claimed invention to one of ordinary skill in the art of performing photolithography at the time the invention was made.

In view of the foregoing, Applicants respectfully request the Examiner to withdraw the rejections to claims 27-30 under 35 U.S.C. §103 (a).

Conclusion

Applicants believe that all claims pending, including claims 1-30, are now in condition for allowance so such action is earnestly solicited at the earliest possible date.

Pursuant to 37 C.F.R. 1.136 (a) (3), Applicants hereby request and authorize the U.S. Patent and Trademark Office to treat any concurrent or future reply that requires a petition for extension of time as incorporating a petition for extension of time for the appropriate length of time.

Should there be any additional charge or fee, including extension of time fees and fees under 37 C.F.R. 1.16 and 1.17, please charge Deposit Account No. 50-0221.

If a telephone interview would in any way expedite the prosecution of this application, the Examiner is invited to contact the undersigned at (408) 653-7897.

Respectfully submitted,
INTEL CORPORATION

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_____/George Chen/_____
George Chen
Reg. No. 50,807

Intel Corporation
c/o CPA Global LLC
P.O. Box 52050
Minneapolis, MN 55402

(408)-653-7897